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Target Diagnostic Operations Summary August 28-29, 2009

D. W. Larson

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Disclaimer

This work performed under the auspices of the U.S. Department of Energy by Lawrence Livermore National Laboratory under Contract DE-AC52-07NA27344.

Target Diagnostic Operations Summary

August 28-29, 2009

Experiment: Hohlraum_Act_D_S08d

This campaign will validate the capability of fielding cryogenic hohlraums by demonstrating that the radiation temperature is not affected by contamination and ice buildup.

First NIF shot with cryogenically cooled target.

19K 0.9 scale Au HVac target. 600 kJ with 2ns FIT pulse, 192 beams with Rev 1 and Rev 3 CPPs.

Shot ID: N090828-002-999

Issues / Results Summary

Good data acquired on all participating diagnostics.

This was the first shot with NToF participating. Since no neutrons are generated by this shot, the purpose of participating NToF was to find out how much unwanted signal is generated by the X-rays and EMI. The interesting traces produced by this shot are included at the end of this report.

Known Issues, still with us:

FABS

Randomly at any time, a GSCP Camera "CCD Initialized" status will go red. Have to command Re-Init CCD, then all is well again. Existing Problem Log 294562.

NBI

NBI Q31B SRS camera cooler does not work – creates alarms. Existing Problem Log #294565.

NBI Q31B SRS camera cooler problem exposes an error in the TDS shot software: if a diagnostic has an error so that the rolled-up Ready status is "Usable" instead of "Ready", then the shot software does not handle the situation correctly. The shot software does not wait for all the participating diagnostics to get to the Set state before figuring the Min Tick, so Min Tick is set incorrectly. Until the software is fixed, the workaround is to set the Shot Supervisor to Manual Mode so the Min Tick step may be initiated after all the diagnostics are in the Set state. New Problem Log #295388.

Shot software tries to send GoTo setpoint commands to non-existent NBI SPECTRALON-CCD cameras. Result is all Macrosteps that setup the video cameras fail. Existing Problem Log #294566.

Operators

TDOs

Jeff Baron

Brandi Lechleiter

TDC

Karl Pletcher

Participation

SXI-Lower (161,326)	Secondary
SXI-Upper (018,123)	Dropped (Camera replaced with an 'image plate', which is completely passive, so no software control required or desired)
Dante-Lower (143-274)	Primary
Channels 1 – 18	Primary
Dante-Upper (064-350)	Dropped
FABS Q31B	Secondary
Camera B315	Secondary
Camera B316	Secondary
Camera B317	Secondary
Camera B318	Secondary
SRS Fast Diode Scope	Secondary
SBS Fast Diode Scope	Secondary
Slow Diode Scope	Secondary
Streak Camera SRS	Secondary
Streak Camera SBS	Secondary
Cal Spect Camera	Secondary
Gate Monitor Scope	Secondary
FABS Q36B	Secondary
Camera B365	Secondary
Camera B366	Secondary
Camera B367	Secondary
Camera B368	Secondary
SRS Fast Diode Scope	Secondary
SBS Fast Diode Scope	Secondary
Slow Diode Scope	Secondary
Streak Camera SRS	Secondary
Streak Camera SBS	Secondary
Cal Spect Camera	Secondary
Gate Monitor Scope	Secondary
NBI (Q31B)	Secondary
Scope	Secondary

GSCP	Not Used
SRS Camera	Secondary
SRS Diode	Secondary
SBS Camera	Secondary
SBS Diode	Secondary
NBI (Q36B)	Secondary
Scope	Secondary
GSCP	Not Used
SRS Camera	Secondary
SRS Diode	Secondary
SBS Camera	Secondary
SBS Diode	Secondary
FFLEX (090,110)	Secondary
PMTs 1-10	Secondary
EEMP	Tertiary, run manually
NToF 4m (064,275)	Tertiary, run manually

Setup

Timing

Client Delays

SXI-Lower (161,326)

CCD –Trigger (CCD)	500,000,000 ns

Dante-1 (Lower, 143,274)

Trigger 1	0.0 ns
Trigger 2	9.0 ns
Trigger 3	4.5 ns

FABS Q31B

CAL-SPECT-CCD	-890 ns (was changed in database today from -894 ns)
SBS Streak CCD	500,000,000 ns
SBS Streak Comb	-1234 ns
SBS Streak Sweep	-284.637 ns
SCOPE	0 ns
SPECTRALON-CCD	-750,000 ns
SRS Streak CCD	500,000,000 ns
SRS Streak Comb	-1385 ns
SRS Streak Sweep	-424.773 ns

FABS Q36B

CAL-SPECT-CCD	-700.0 ns setpoints have three different values, is -700 for Shot
SBS Streak CCD	500,000,000 ns
SBS Streak Comb	-1100 ns

SBS Streak Sweep	-194 ns (was changed in database today from - 184 ns)
SCOPE	0 ns
SPECTRALON-CCD	-750,000 ns
SRS Streak Comb	-1150 ns
SRS Streak Sweep	-197 ns
SRS Streak CCD	500,000,000 ns

NBI (Q31B)

Cal Laser DIAG	-1093 ns

NBI (Q36B)

Cal Laser DIAG	-1093 ns

FFLEX

Trigger	412 ns

EEMP

Scopes	345, 345, 345 ns

NToF 4m (064,275)

Scope Trigger	0 ns

Configurations

Dante-Lower (143,274)

Attenuator configuration was not finalized in time to put into M-SSAR. Verified configuration per setup sheet from Dante RI.

Channel	Current attenuators (dB)
1	6, 6
2	6, 20
3	14, 14
4	2, 2, 14
5	20, 2, 2
6	6, 14
7	10, 14
8	6, 20
9	1, 3, 20
10	10, 20
11	20, 14
12	6, 6, 6

13	14
14	2, 6
15	20, 20
16	20, 20
17	20, 20
18	20, 20

FABS Q31B

SRS Fast Diode Scope

Channel 1 Vertical Range	2 V
Channel 2 Vertical Range	2 V
Channel 3 Vertical Range	2 V
Channel 4 Vertical Range	2 V

SBS Fast Diode Scope

Channel 1 Vertical Range	2 V
Channel 2 Vertical Range	2 V
Channel 3 Vertical Range	2 V
Channel 4 Vertical Range	2 V

Slow Diode Scope

Channel 1 Vertical Range	2 V
Channel 2 Vertical Range	2 V
Channel 3 Vertical Range	2 V
Channel 4 Vertical Range	2 V

SRS Streak Camera

Sweep Speed	40ns

SBS Streak Camera

Sweep Speed	40ns

FABS Q36B

SRS Fast Diode Scope

Channel 1 Vertical Range	2 V
Channel 2 Vertical Range	2 V
Channel 3 Vertical Range	2 V
Channel 4 Vertical Range	2 V

SBS Fast Diode Scope

Channel 1 Vertical Range	2 V
Channel 2 Vertical Range	2 V
Channel 3 Vertical Range	2 V

Channel 4 Vertical Range	2 V

Slow Diode Scope

Channel 1 Vertical Range	2 V
Channel 2 Vertical Range	2 V
Channel 3 Vertical Range	2 V
Channel 4 Vertical Range	2 V

SRS Streak Camera

Sweep Speed	40ns

SBS Streak Camera

Sweep Speed	40ns

NBI Q31B

Scope

Channel 1 Vertical Scale	0.1 V/division
Channel 2 Vertical Scale	1.0 V/division
Channel 3 Vertical Scale	1.0 V/division
Channel 4 Vertical Scale	1.0 V/division

NBI Q36B

Scope

Channel 1 Vertical Scale	0.1 V/division
Channel 2 Vertical Scale	1.0 V/division
Channel 3 Vertical Scale	1.0 V/division
Channel 4 Vertical Scale	1.0 V/division

NToF 4m (064,275)

Scope

Channel 1 Vertical Scale	0.05 V/division
Channel 2 Vertical Scale	0.01 V/division
Channel 3 Vertical Scale	0.01 V/division
Channel 4 Vertical Scale	0.1 V/division

FLEX Settings

Scope	Horizontal Scale [µs/div]	PM Tube #	HVPS Voltage [V]	Capacitance [pF]	Channel #	Vertical Full Range [V]
1	25	1	-800	22,000	1	0.50
					2	10
		2	-830	100,000	3	0.50
					4	10
2	25	3	-800	100,000	1	0.50
					2	10
		4	-820	100,000	3	0.50
					4	10
3	25	5	-900	22,000	1	0.50
					2	10
		6	-730	22,000	3	0.50
					4	10
4	25	7	-760	22,000	1	0.50
					2	10
		8	-870	22,000	3	0.50
					4	10
5	25	9	1,100†	4,700	1	0.50
					2	10
		10	1,400†	4,700	3	0.50
					4	10
6	0.5	9	1,100†		1	0.50
					2	10
		10	1,400†		3	0.50
					4	10

† Not listed in M-SSAR.

EEMP

	Scope 1	Scope 2	Scope 3
Channel 1 V/div	0.5	0.5	0.5
Channel 2 V/div	1.0	0.5	0.5
Channel 3 V/div	0.5	0.5	0.5
Channel 4 V/div	1.0	0.1	0.5
Sweep Speed, ns/div	200	200	200

Startup Issues

Dante Scope 18 reported IO_ERROR. Investigation found that the GPIB address selector switches had been disturbed. Set them all to zero, then to desired address. Now works OK.

Independent Dry Runs

All OK.

Integrated Dry Run #1

Had a variety of odd problems, so we decided to try again.

Integrated Dry Run #2

No alarms. All looked good.

Rod Shot N090828-002-001

All looked good, but TDS set Min Tick to -120, should be something more like -250. This is a known issue, we just had to remember what to do about it.

Rod Shot N090828-002-002

Ran Shot Supervisor in Manual Mode and Min Tick gets figured correctly.

Shot aborted due to MOR problem.

Rod Shot N090828-002-003

Shot aborted due to PEPC problem.

Rod Shot N090828-002-004

Except for two nuisance alarms, all looked good.

FFLEX (090,110) HVPS

When going to Set state, got this nuisance alarm:
OUT OF RANGE - /PS350@GPIB0::1::INSTR/SetPoints/VoltageSetting, current value = -800.0. Target:-1250.0 RangeType:TargetExactVoltage Setting Range condition
Controller GUI indicated the voltage was set as desired.

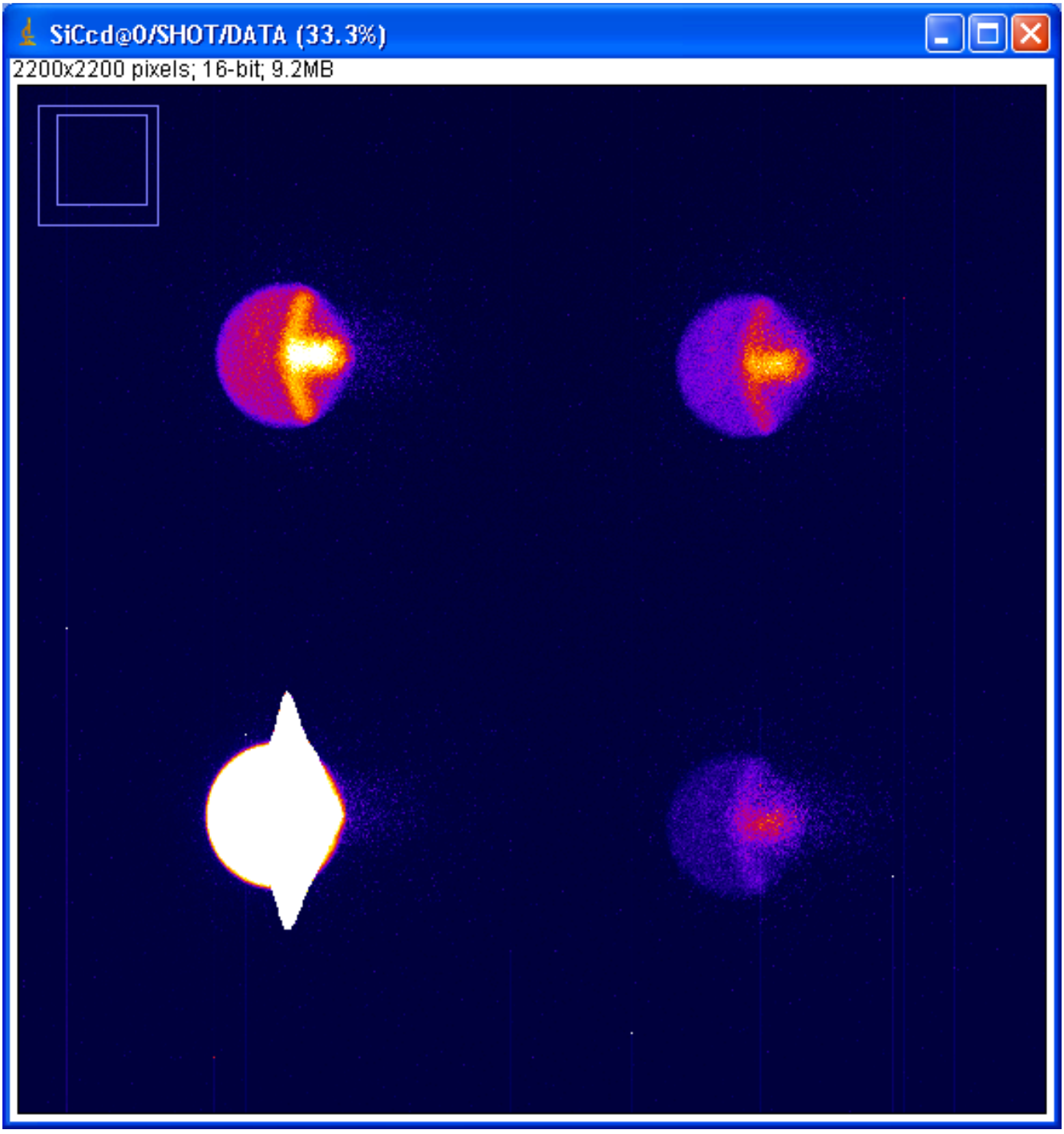
FABS Q36B SBS Streak Camera

At about t+20, got this nuisance alarm:
OUT OF RANGE - SiCcd@0/CCD Trigger State, current value = TRIGGERED. Target:IDLE RangeType:TargetExact CCD Trigger State range condition

System Shot N090828-002-999

Shot fired at 2009 August 29 02:48:36

SXI Lower (161,326)



Dante-1 (143,274)

All channels recorded high quality pulses.

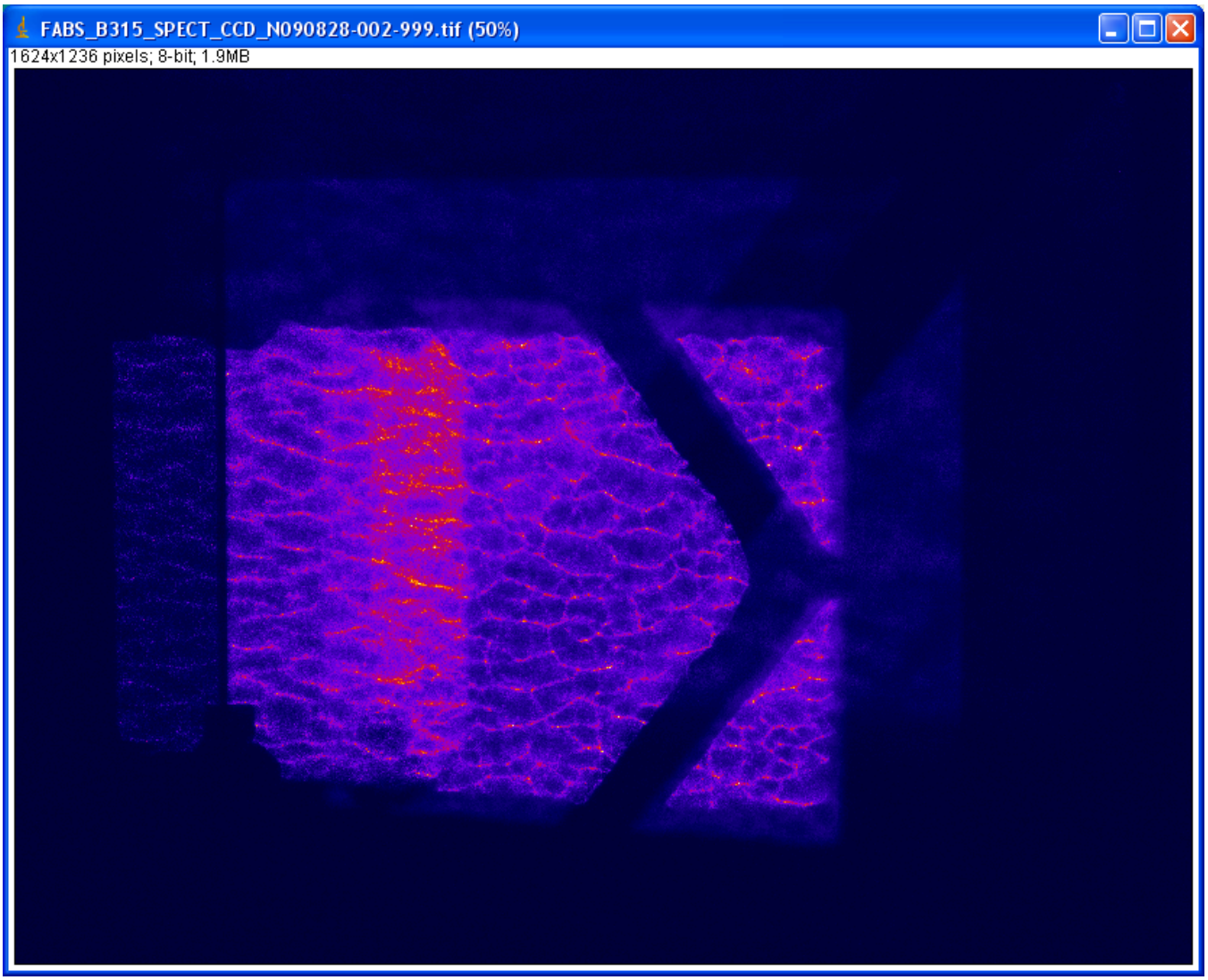
At about t+40 got this alarm from the HVPS:
OUT OF RANGE - /PS350@GPIB0::1::INSTR/Status/CurrentTripEvent, current value = true.

Target:false RangeType:TargetExactCurrent Trip Event condition.
Controller GUI also indicates Current Trip.

FABS Q31B

No problems. All data acquired.

B315 Spectralon CCD



FABS Q36B

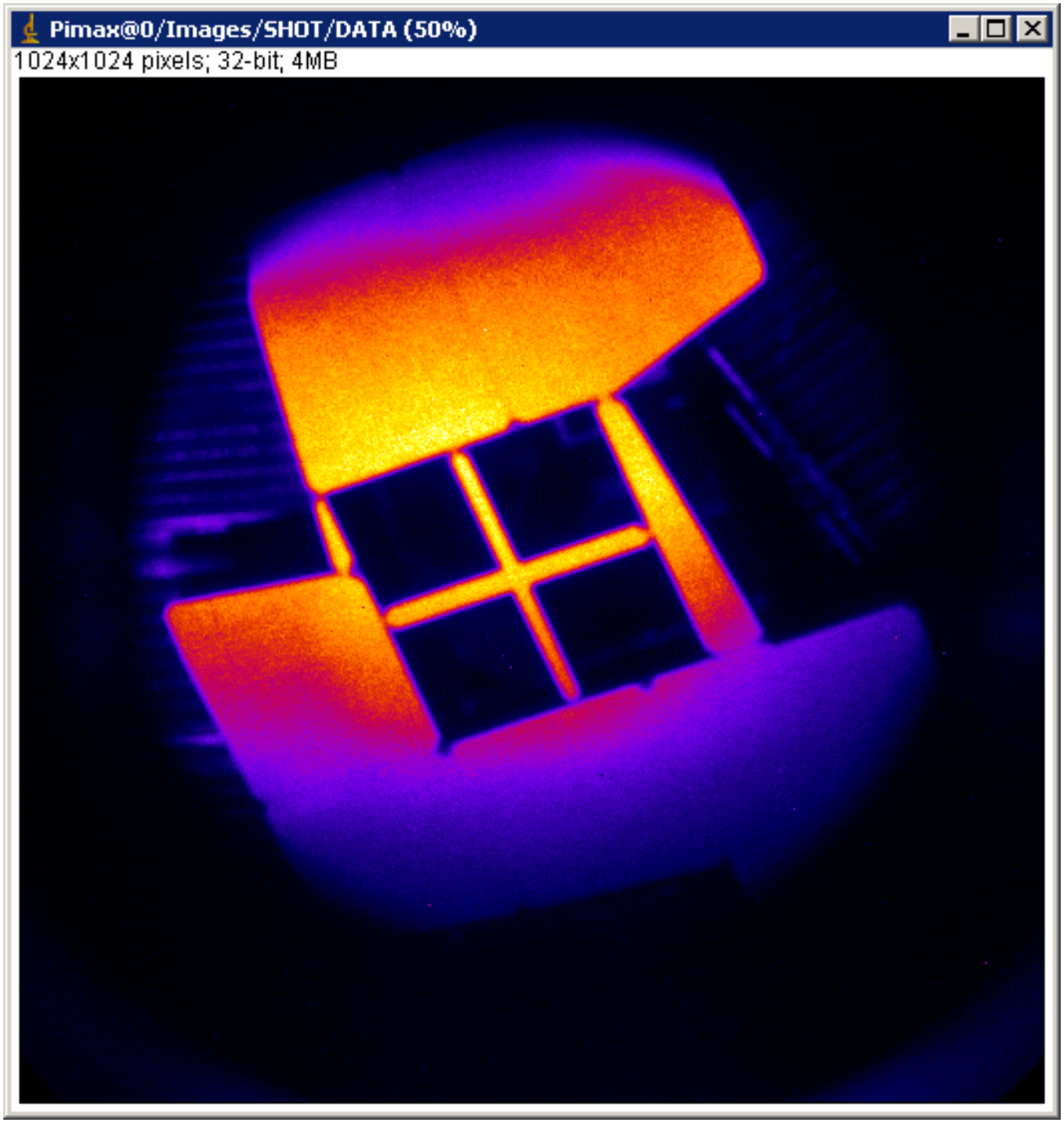
Good data acquired.

During countdown, SRS Fast Diode Scope indicated Triggered on prematurely on TD Shot Manager GUI, but controller GUI indicated armed. This is a known issue.

NBI Q31B

No problems. All data acquired.

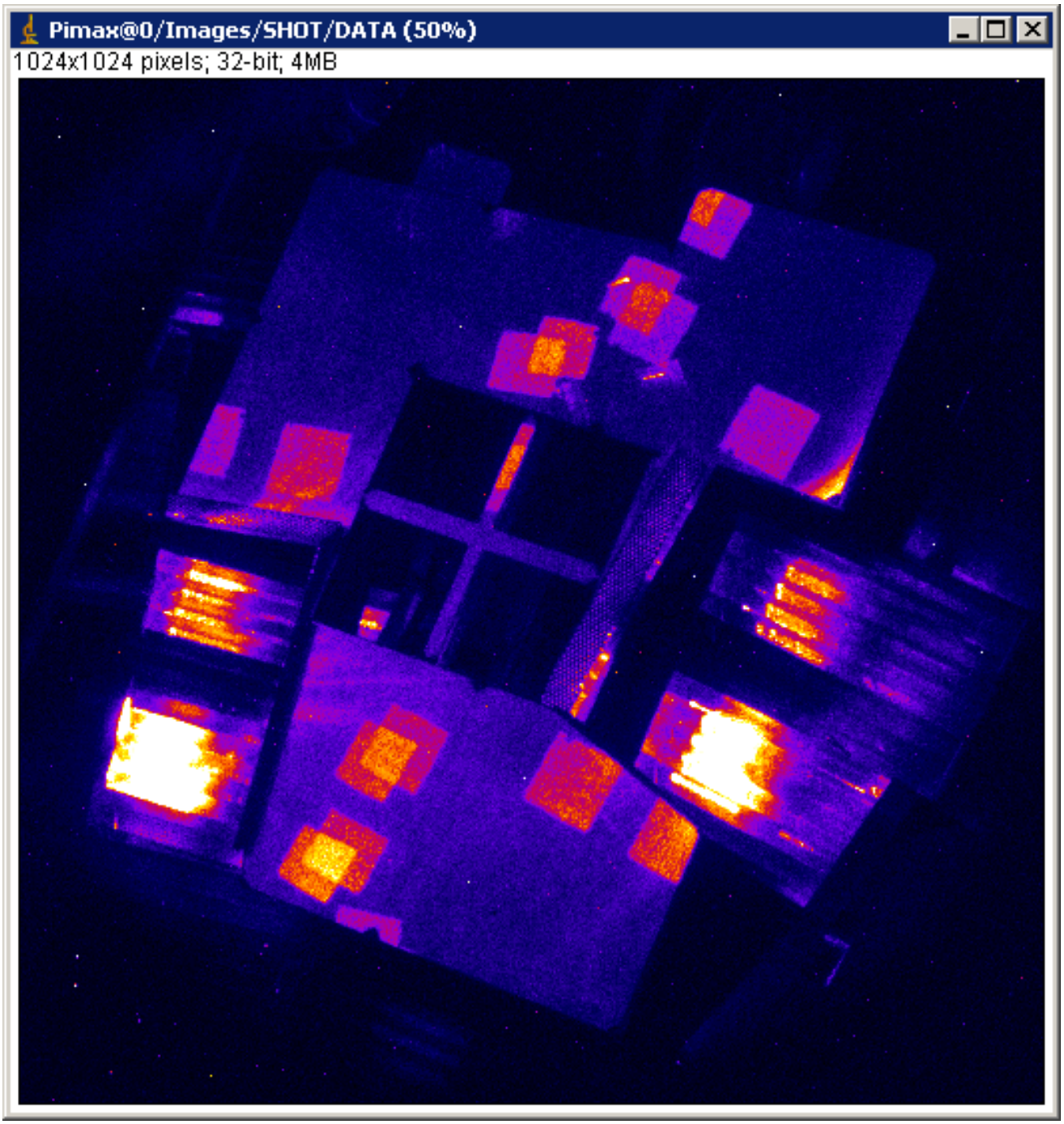
SBS



NBI Q36B

No problems. All data acquired.

SRS



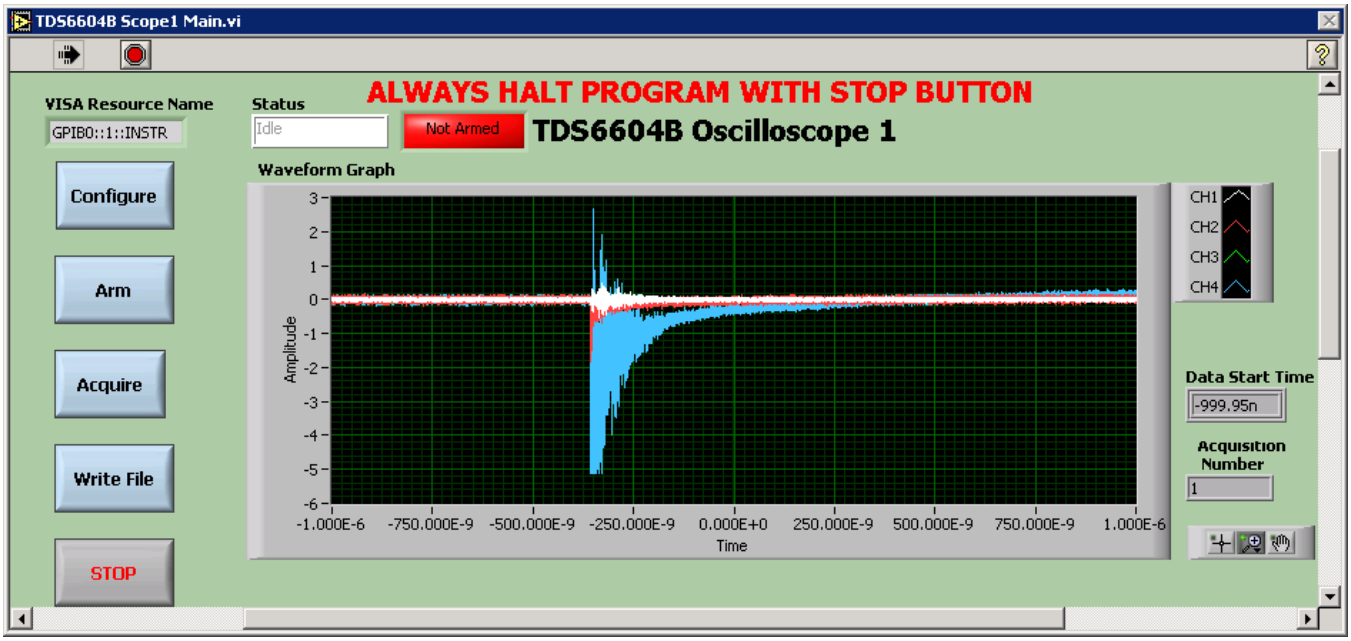
FFLEX (090,110)

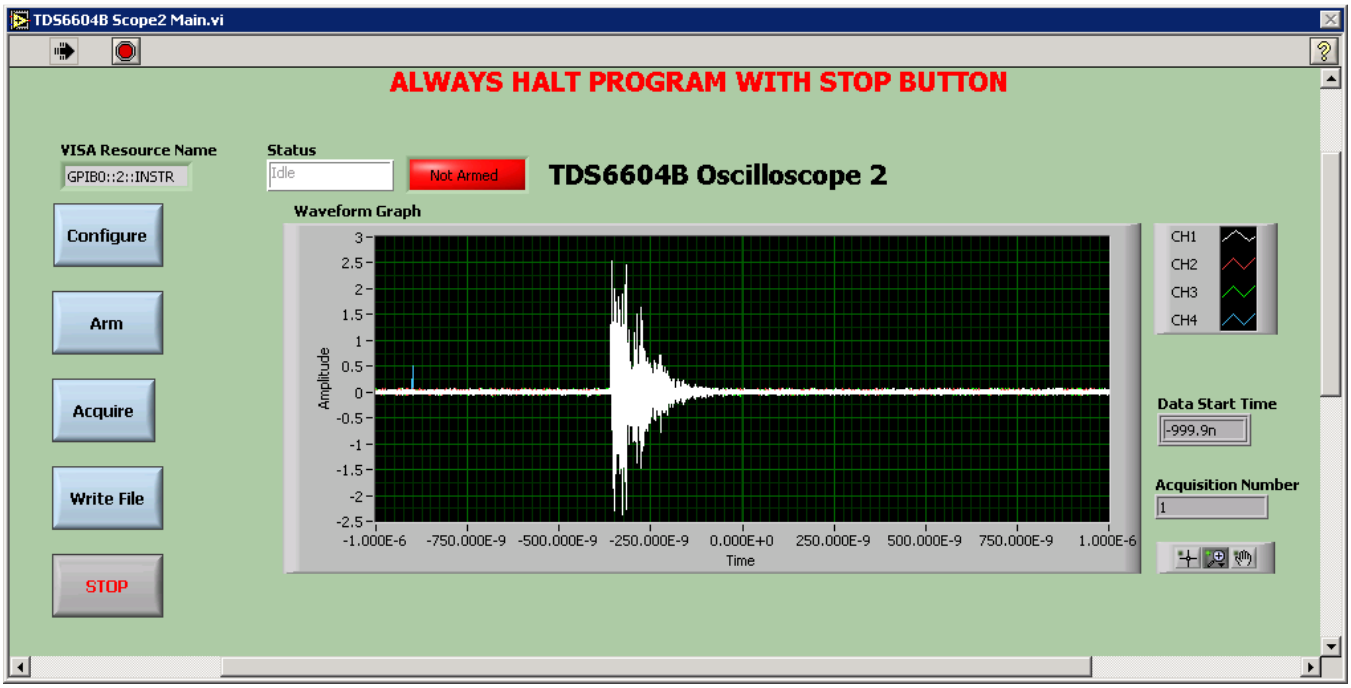
Recorded good pulses. Only clipped pulse was on Scope 3 channel 1.

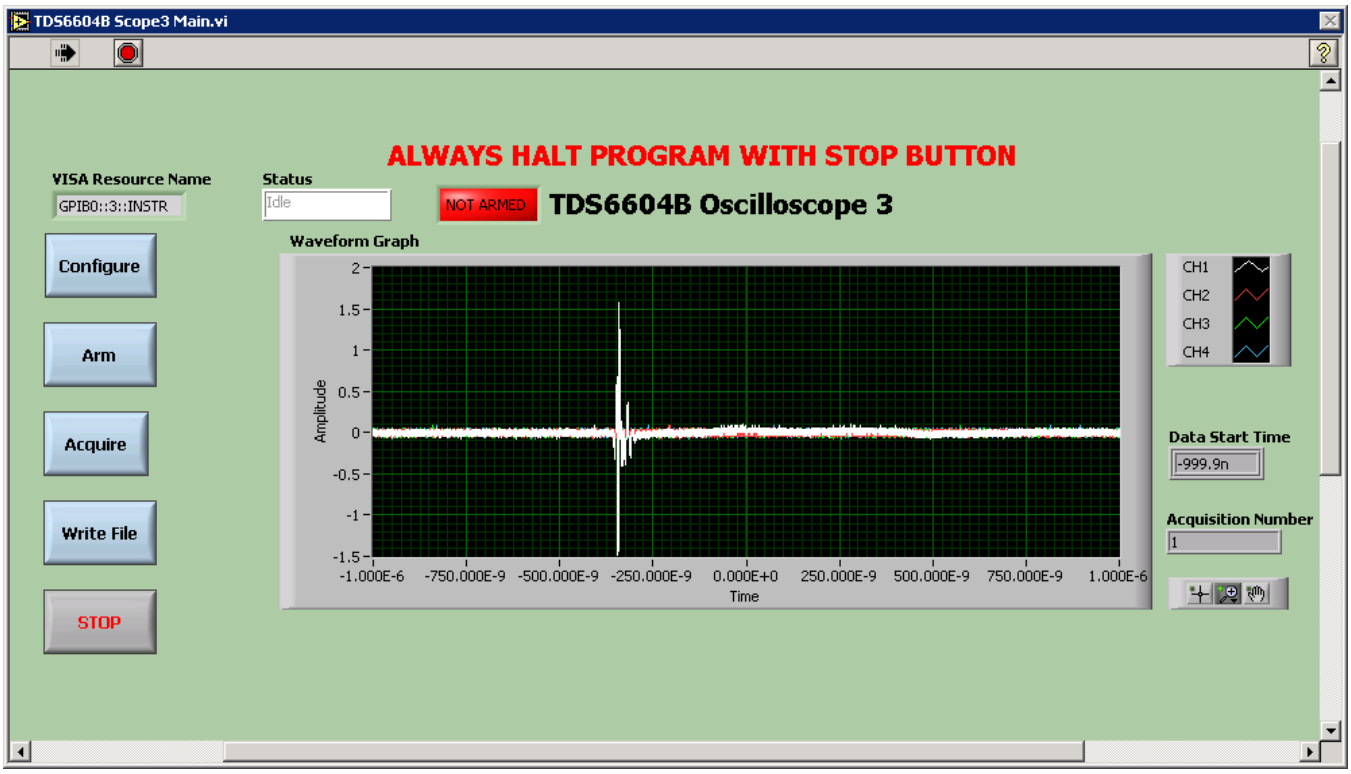
Going to Set state, got a couple of the nuisance alarms from two of the HVPSs, similar to that obtained during Rod Shot

During countdown, FFLEX scope 6 indicated Triggered prematurely on TD Shot Manager GUI, but controller GUI indicated armed. This is a known issue.

EEMP






TDS6604B Scope3 Main.vi
ALWAYS HALT PROGRAM WITH STOP BUTTON
VISA Resource Name
GPIB0::3::INSTR
Status
Idle
NOT ARMED
TDS6604B Oscilloscope 3
Waveform Graph
Configure
Arm
Acquire
Write File
STOP
Amplitude
Time
CH1
CH2
CH3
CH4
Data Start Time
-999.9n
Acquisition Number
1

NToF 4m (064,275)

When going to Set State, got this alarm from TD-NTOF-4M-SC-LCU:
DC Error message: Target_Diag_Lcu.Impl.Concrete.Distribute_Command HTC Disable failed for Unexpected exception in Target_Diag_Lcu.Impl.Concrete.Distribute_Command - CONSTRAINT_ERROR raised at 16#01238A84#, Exception Message: On Trigger TIMING|TC|NTOF-4M|SCOPE-HTRIG; Unexpected exception in Target_Diag_Lcu.Impl.Concrete.Distribute_Command - CONSTRAINT_ERROR raised at 16#01238A84#, Exception Message: On Trigger TIMING|TC|NTOF-4M|GATE-HTRIG
Settings on Trigger GUI look as desired for the shot.